

AMENDMENTS TO THE CLAIMS

1. (Currently Amended) A system for processing a stereo input signal which includes center information, matrix encoded surround information, and stereo information, the system comprising:

first circuit for providing a center output which includes center monaural information, wherein the first circuit comprises a first summer which combines one channel of the stereo input signal with the other channel of the stereo input signal to form a center combined signal which has the surround information removed;

second circuit for providing a surround output from the matrix encoded surround information which includes surround monaural information; and

third circuit for providing an expanded stereo output;

wherein the first circuit, the second circuit, and the third circuit process the stereo input signal to produce first and second output signals.

2. (Original) The system of claim 1, wherein:
the first and second output signals are respectively delivered to first and second speakers.

3. (Original) The system of claim 1, wherein:
the center output is used to form a phantom center sound image;
the surround output is used to form two virtual surround images; and
the expanded stereo output is used to form expanded stereo sound images.

4. (Original) The system of claim 3, wherein:
the phantom center sound image appears to a listener of the system to be located between a pair of speakers;
each virtual surround image appears to the listener to be located at a position which forms an obtuse angle with said pair of speakers; and
each stereo sound image appears to be located outside the physical limits of each speaker.

5. (Cancelled)

6. (Currently Amended) The system of claim [[5]]1, further comprising:
a multiplier which modifies the center combined signal.

7. (Currently Amended) The system of claim [[5]]1, further comprising:
a second summer which combines the center combined signal with one channel of the stereo input signal to form the first output signal; and
a third summer which combines the center combined signal with the other channel of the stereo input signal to form the second output signal.

8. (Original) The system of claim 1, wherein the second circuit comprises:
a fourth summer which combines one channel of the stereo input signal with an inverse of the other channel of the stereo input signal to form a surround combined signal which has the center information removed.

9-12. (Cancelled)

13. (Original) The system of claim 1, wherein the third circuit comprises:
circuit for combining one channel of the stereo signal with an inverse of the other channel of the stereo signal to form a difference signal; and
circuit for adjusting an amplitude and phase of the difference signal on a frequency dependent basis to form a third filtered signal.

14. (Original) The system of claim 13, further comprising:
a ninth summer which combines said third filtered signal with the one channel of the stereo input signal to form the first output signal; and
a tenth summer which combines an inverse of said third filtered signal with the other channel of the stereo input signal to form the second output signal.

15-16. (Cancelled)

17. (Original) The system of claim 13, wherein the circuit for adjusting to form said third filtered signal comprises:

a Q-filter.

18. (Original) The system of claim 8, further comprising:
an eleventh summer which combines an inverse of the surround combined signal with the one channel of the stereo input signal to form the first output signal; and
a twelfth summer which combines the surround combined signal with the other channel of the stereo input signal to form the second output signal.

19. (Cancelled)

20. (Currently Amended) A method for processing a stereo input signal which includes center information, matrix encoded surround information, and stereo information, the method comprising the steps of:

(a) providing a center output which includes center monaural information;
(b) providing a surround output from the matrix encoded surround information which includes surround monaural information; and

(c) providing an expanded stereo output;

(d) forming, via the center output, a phantom center sound image;

(e) forming, via the surround output, two virtual surround images; and

(f) forming, via the expanded stereo output, expanded stereo sound images;

wherein the steps (a), (b), and (c) process the stereo input signal to produce first and second output signals.

21. (Original) The method of claim 20, further comprising the step of:
delivering, respectively, the first and second output signals to first and second speakers.

22. (Cancelled)

23. (Currently Amended) The method of claim 20, wherein:
the phantom center sound image appears to a listener of the system to be located between a pair of speakers;
each virtual surround image appears to the listener to be located at a position which forms an obtuse angle with said pair of speakers; and
each stereo sound image appears to be located outside the physical limits of each speaker.

24. (Original) The method of claim 20, wherein the step (a) comprises the step of:
combining one channel of the stereo input signal with the other channel of the stereo input signal to form a center combined signal which has the surround information removed.

25. (Original) The method of claim 24, wherein step (a) further comprises the step of:
controllably multiplying the center combined signal.

26. (Original) The method of claim 24, wherein step (a) further comprises the step of:
combining the center combined signal with one channel of the stereo input signal to form the first output signal; and
combining the center combined signal with the other channel of the stereo input signal to form the second output signal.

27. (Original) The method of claim 20, wherein the step (b) comprises the step of:
combining one channel of the stereo input signal with an inverse of the other channel of the stereo input signal to form a surround combined signal which has the center information removed.

28-38. (Cancelled)

39. (Original) A system for processing a stereo input signal which includes center information, matrix encoded surround information, and stereo information, the system comprising:

first circuit for providing a center output having center monaural information, which includes a first summer which combines one channel of the stereo input signal with the other channel of the stereo input signal to form a center combined signal which has the surround information removed;

second circuit for providing a surround output from the matrix encoded surround information having surround monaural information, which includes a second summer which combines one channel of the stereo input signal with an inverse of the other channel of the stereo input signal to form a surround combined signal which has the center information removed; and

third circuit for providing an expanded stereo output, which includes a first Q-filter which adjusts an amplitude and phase of the surround combined signal on a frequency dependent basis to form a first filtered signal;

wherein the center combined signal, the surround combined signal, and the filtered signal are used to produce first and second output signals.

40. (Original) The system of claim 39, further comprising:

a third summer which combines the center combined signal with one channel of the stereo input signal to form a first signal;

a fourth summer which combines the center combined signal with the other channel of the stereo input signal to form a second signal;

a fifth summer which combines an inverse of the surround combined signal with the first signal to form the third signal;

a sixth summer which combines the surround combined signal with the second signal to form a fourth signal;

a seventh summer which combines the first filtered signal with the third signal to form the first output signal; and

an eighth summer which combines an inverse of the first filtered signal with the fourth signal to form the second output signal.

41-45. (Cancelled)